

CLAIMS

I claim:

1. A cooling apparatus for a laser system comprising:

a single circulating unit having a tank for holding a supply of cooling fluid, and a pumping device operative for circulating said cooling fluid through a laser source, a laser power supply, a light valve and back into the circulating unit;

wherein a flow of said cooling fluid is divided into first and second parallel supply branches, said laser source connected in series with said first supply branch, and wherein said light valve and said laser power supply are connected in series with said second supply branch; and

wherein the flow of said cooling fluid in said second parallel supply branch passes through the laser power supply after the flow of said cooling fluid has passed through said light valve.

2. The cooling apparatus of claim 1 wherein said circulating unit further includes a refrigeration unit operative to cool said cooling fluid below normal room temperature.

3. The cooling apparatus of claim 1 further comprising a flow rate sensor connected in series to a coolant outlet port of said laser source, said flow rate sensor operative to provide a signal to a controller, said signal representative of a flow rate of cooling fluid passing through said laser source.

4. The cooling apparatus of claim 3 wherein said controller shuts down said power supply when said signal falls below a predetermined value indicating said flow rate of cooling fluid has decreased below a desired flow rate.

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wherein the flow of said cooling fluid in said second parallel branch passes through the laser power supply after the flow of said cooling fluid has passed through said light valve.

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providing a single circulating unit having a tank for holding a supply of cooling fluid, and a pumping device operative for circulating said cooling fluid through said laser source, a flow rate sensor, a flow control valve, said laser light valve, said laser power supply, and back into the circulating unit;

providing a first parallel flow path by serially connecting said laser source and said flow rate sensor together, and connecting a coolant inlet port disposed on said laser source to a coolant supply port of said circulating unit, and further connecting a coolant outlet port of said flow rate sensor to a coolant return port disposed on said circulating unit;

providing a second parallel flow path by connecting said coolant supply port of said circulating unit to a first port of said flow control valve, and serially connecting a second port of said flow control valve to a first port of said laser light valve, and serially connecting a second port of said laser light valve to a coolant input port of said laser power supply, and then connecting a coolant outlet port of said laser power supply to said coolant return port deposited on said circulating unit;

establishing flow of cooling fluid through each of first and second parallel flow paths wherein a first flow rate of cooling fluid through said first parallel path is different than a second flow rate of cooling fluid through said second parallel path;

wherein said first rate of cooling fluid flow is determined by a size and number of cooling channels formed in a portion of said laser; and

wherein said second rate of cooling fluid flow is controlled by said flow control valve, said flow control valve further operative to maintain said second rate of cooling fluid flow constant.

